

DaimlerChrysler AG

Pedal bearing block

The invention relates to a pedal bearing block according to the precharacterizing clause of patent claim 1.

DE 100 17 794 A1 discloses a pedal bearing block which is of single-part design. Only one material can be used in a single-part design of a pedal bearing block. A pedal bearing block of plastic requires a large amount of construction space in order to achieve the necessary stiffness. By contrast, a compact pedal bearing block of metal has a high weight. Although the weight is reduced when light metals are used, high material costs arise.

EP 1 052 562 A3 discloses a pedal bearing block for receiving a pedal for a motor vehicle, with a basic body. The basic body comprises a shell and a reinforcing element assigned to the shell.

Against this background, the present invention is based on the object of providing a pedal bearing block of the type mentioned at the beginning which can be produced at low weight and cost-effectively and at the same time requires little construction space.

This object is achieved by a pedal bearing block with the features of claim 1. According thereto, the pedal bearing block is distinguished by a basic body with two separate components, a shell and a reinforcing element. The reinforcing element has a stiffening function. The multipart design of the basic body enables the shell and the reinforcing element to be formed from different materials, with it being possible for the positive

properties of the individual materials to be combined with one another. For example, plastic has a low weight and metal high stability. As a result, in a compact construction of the pedal bearing block the stiffness can be increased and the weight reduced at the same time.

In order to provide the basic body with basic stability, said basic body consists of metal, such as, for example, steel plate. In the case of a compact construction, steel permits a higher strength than a plastic component with the same dimensions.

In order to further increase the stiffness of the shell, according to one embodiment the shell has a collar on its encircling edge. If, in conjunction with the invention, a collar is discussed, then what is meant by this is an outer edge of the shell which is essentially bent at right angles. This collar also optimizes the force flux in the pedal bearing block. A force introduced into the pedal bearing block via a pedal is distributed over a large area via the collar, as a result of which individual regions of the pedal bearing block are relieved of load.

For the furthermore required stability of the shell, an additional plastic reinforcing element is injection molded on the shell. Plastic parts have the advantage that they have a lower weight and can be produced more cost-effectively in comparison to metal parts with identical dimensions. Furthermore, the plastic parts can be injection molded onto the shell of the basic body by injection molding processes. In this connection, no complicated adaptation of the plastic part to the shell is necessary, since, during the injection molding operation, the plastic part is automatically matched to the shell which forms part of

the injection mold. Tolerances therefore do not have to be taken into consideration, which makes the production considerably more favourable in terms of costs.

As an alternative to the conventional injection molding process, it is also conceivable to use a foam injection molding technology to produce the plastic part or reinforcing element. Central element of the process is a gas supply unit. A foaming agent, for example NO_2 , is injected under a pressure of 100 to 200 bar into a plastic melt. The foaming agent dissolves in the plastic melt and expands upon injection, with it expanding the plastic. A microcellular structures is therefore obtained.

In comparison to conventional injection molding, foam injection molding permits a homogeneous structure, little distortion and the shaping of thin-walled regions. In addition, this process provides a saving of weight of up to 30%, since better mechanical properties specific to the weight are achieved. Owing to system-inherent properties, such as lower retaining, cooling and cycle times, reduction in the machine size because of a lower pressure level, improvement in the melt viscosity and reduction of waste, cost reductions are obtained. The possible retrofitting of conventional machines and the use of standard injection molds are likewise to be stressed as being positive. The foam injection molding process is suitable for known plastics, in particular for PA, PP, POM, TPE/PP.

Owing to the advantages cited, foam injection molding is eminently suitable for combination with hybrid technology to assist the lightweight construction.

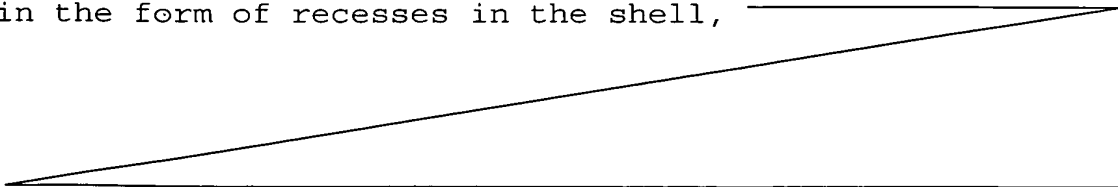
In order to produce the reinforcing element as cost effectively as possible, according to a further

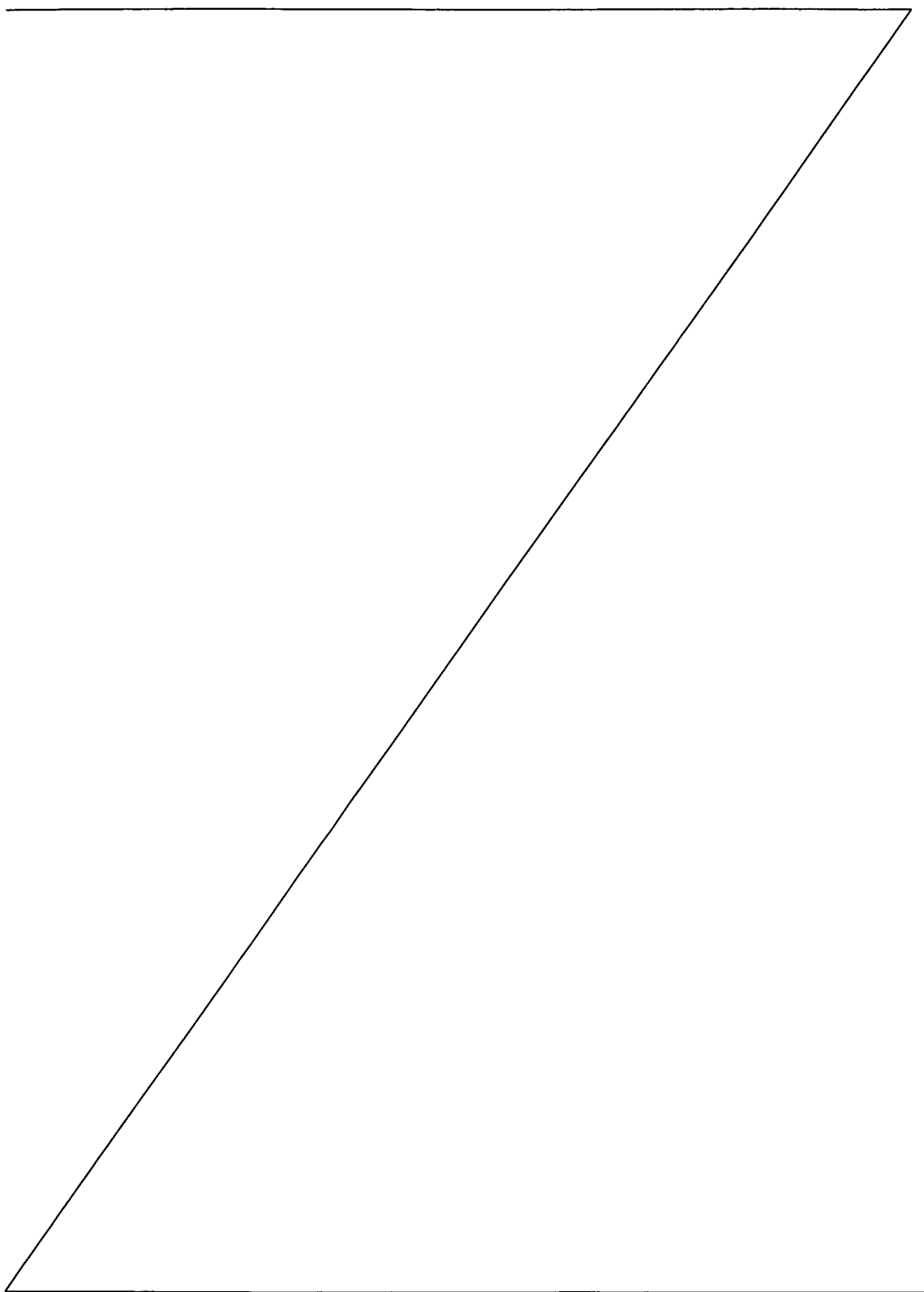
embodiment the reinforcing element has a rib structure in the interior of the metal shell. As a result, the desired stability is accompanied by a saving in a simple manner on material and weight and the costs are therefore reduced.

A bearing point for a pedal bearing is placed into the shell and the reinforcing element which is injection molded both onto the outside and inside of the shell. Since great forces are introduced into the bearing point by a pedal, the bearing point has to have a high strength. By means of the multipart, sandwich-like construction of the bearing point, it is possible to provide the bearing point with basic stability by means of a metal core which corresponds to the shell. The reinforcing element has the task of forming the actual pedal bearing.

According to a further embodiment, the bearing point has ribs arranged axially and radially to the longitudinal axis of the pedal bearing, for reinforcement. Ribs have the advantage that they save both material and weight while providing optimum reinforcement. As a result, the costs are further reduced.

According to a further embodiment, the two parts of the basic body are connected fixedly to each other. For this purpose, the collar of the shell is at least partially encapsulated with plastic by injection molding, so that the reinforcing element is secured on the shell. Furthermore, the shell has permeating holes in the form of recesses in the shell,





AMENDED SHEET

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Patent Claims

1. A pedal bearing block for receiving a pedal for a motor vehicle, with
 - a basic body which has a shell (1) and a reinforcing element (11) assigned to the shell (1),
 - a connecting point for fastening the pedal bearing block to a front wall, and
 - a bearing point for receiving a pedal bearing, characterized in that the shell (1) consists of metal and the reinforcing element (11) consists of plastic, with the bearing point (13) being formed by the reinforcing element (11) and the shell (1).
2. The pedal bearing block as claimed in claim 1, characterized in that the shell (1) has an edge (6) encircling it in some regions.
3. The pedal bearing block as claimed in claim 1 or 2, characterized in that the reinforcing element (11) has ribs (12).
4. The pedal bearing block as claimed in claim 1, characterized in that the reinforcing element (11) has ribs (14) around the bearing point (13) of the pedal bearing.
5. The pedal bearing block as claimed in claim 1, characterized in that the reinforcing element (11) is secured on the shell (1).
6. The pedal bearing block as claimed in one of the preceding claims, characterized in that the

reinforcing element (11) substantially envelopes the encircling edge (6) of the shell (1).

7. The pedal bearing block as claimed in one of the preceding claims, characterized in that the reinforcing element (11) has receiving elements (17, 20, 21, 23) for receiving functional elements.